

What is claimed is:

1. A spinal stabilization system, comprising:  
an elongated stabilization device including a curved configuration along a longitudinal axis thereof, said stabilization device including a length and cross-section sized for positioning through a pathway, said pathway being formable from an opening in a lateral mass of a first vertebra and into the first vertebra, through a facet joint formed by adjacent articular surfaces of the first vertebra and an adjacent bony structure, and into the adjacent bony structure.
2. The system of claim 1, wherein said stabilization device is a rigid rod.
3. The system of claim 1, wherein said stabilization device includes a threaded nose at a leading end thereof.
4. The system of claim 3, wherein said stabilization device includes a flexible body extending from said leading end.
5. The system of claim 4, wherein said stabilization device includes a threaded nose at a trailing end of said body.
6. The system of claim 5, wherein said leading end nose and said trailing end nose include a thread pitch that differs from one another.

7. The system of claim 3, wherein said stabilization device includes a body extending from said leading end to a trailing end, and further comprising an engagement member at a trailing end of said body projecting outwardly from said body, said engagement member being sized greater than a size of the opening.

8. The system of claim 1, wherein said stabilization device includes an elongated outer member and an elongated inner member movably positioned in said elongated outer member.

9. The system of claim 8, wherein said elongated outer member includes a tapered leading end for insertion into the pathway, an opposite trailing end, and a passage extending therebetween.

10. The system of claim 9, wherein said inner member is received in said passage, said inner member being movable between a first position wherein said leading end and said trailing end of said outer member are in a collapsed insertion configuration to a second position wherein at least one of said leading end and said trailing end of said outer member are expanded to engage bony tissue along the insertion pathway.

11. The system of claim 10, wherein each of said leading end and said trailing end are expanded to engage bony tissue along the insertion pathway when said inner member is in said second position.

12. The system of claim 10, wherein said inner member includes a leading end nose with a tapered profile, and said outer member includes an inner surface along said passage with a tapered portion adjacent said leading end of said outer member, wherein in said second position said leading end nose engages said tapered portion of said passage to expand said leading end of said outer member.

13. The system of claim 12, wherein said inner member includes an enlarged trailing end portion and an intermediate nose tapered between said enlarged trailing end portion and a portion of said inner member extending from said enlarged trailing end portion, and said inner surface of said outer member includes an enlarged trailing end portion, wherein in said second position said intermediate nose of said inner member engages said inner surface of said passage at said enlarged trailing end portion to radially expand said trailing end of said outer member.

14. The system of claim 13, wherein said inner member includes a threaded portion to threadingly engage a threaded portion of said inner surface along said passage.

15. The system of claim 13, wherein said intermediate nose and said leading end nose simultaneously engage respective portions of said inner surface of said passage to expand said leading end of said outer member and said trailing end of said outer member.

16. The system of claim 10, wherein said inner member includes an enlarged trailing end portion and an intermediate nose tapered between said trailing end portion and a portion of said inner member extending from said enlarged trailing end portion, wherein in said second

position said intermediate nose of said inner member engages said outer member to expand said trailing end of said outer member into engagement with bony tissue along the pathway.

17. The system of claim 1, wherein the adjacent bony structure is a second vertebra.

18. The system of claim 1, wherein the adjacent bony structure is an occiput.

19. The system of claim 1, wherein the adjacent bony structure is a second vertebra, and the pathway is formed to extend through the second vertebra, through adjacent articular surfaces of the second vertebra and an occiput, and into the occiput.

20. The system of claim 1, wherein said stabilization device includes a leading end and a trailing end, at least one of said leading end and said trailing end being expandable to engage adjacent bony tissue along the pathway.

21. The system of claim 20, wherein each of said leading and said trailing end are expandable.

22. The system of claim 1, wherein the pathway includes a blind end in the adjacent bony structure.

23. The system of claim 1, further comprising:

a drill instrument including an outer shaft with a passage, a cutting device at a leading end of said outer shaft and a coupling member at a trailing end of said outer shaft for receiving a rotary force, said flexible inner member extending through said passage and coupling said cutting device to said coupling member, wherein said outer shaft includes a curved configuration corresponding to the curved configuration of said stabilization device to form the pathway for receiving the stabilization device.

24. The system of claim 1, further comprising:  
an insertion instrument releasably engageable to said stabilization device; and  
a pair of anchors engageable to respective ones of the first vertebra and the adjacent bony structure, said insertion instrument being pivotally mountable to said pair of anchors and movable relative thereto to guide said stabilization device along an arc co-linear with the pathway.

25. A spinal stabilization system, comprising:  
an elongated stabilization device including a curved configuration along a longitudinal axis thereof, said stabilization device including a length and cross-section sized for positioning through a pathway formed through a joint between adjacent bony structures, said stabilization device including an elongated outer member and an elongated inner member, said inner member being movable in said outer member between a first position wherein said stabilization device includes a reduced profile for insertion in the pathway and a second position wherein said inner member engages said outer member to provide at least a portion of said stabilization device with an enlarged profile to engage bony tissue along the pathway.

26. The system of claim 25, wherein said pathway includes an opening in a lateral mass of a first vertebra, said pathway extending into the first vertebra and through a facet joint formed by adjacent articular surfaces of the first vertebra and an adjacent bony structure, said pathway further extending into the adjacent bony structure.

27. The system of claim 25, wherein said outer member includes a tapered leading insertion end, an opposite trailing end, and a passage extending therebetween for receiving said inner member.

28. The system of claim 27, wherein in said first position said leading end and said trailing end of said outer member are in a collapsed insertion configuration, and in said second position at least one of said leading end and said trailing end are expanded to engage bony tissue along the insertion pathway.

29. The system of claim 28, wherein each of said leading end and said trailing end are expanded to engage bony tissue along the insertion pathway when said elongated inner member is in said second position.

30. The system of claim 27, wherein said inner member includes a leading end nose with a tapered profile, and said outer member includes an inner surface along said passage with a tapered portion adjacent said leading insertion end, wherein in said second position said tapered

leading end nose engages said tapered portion of said passage to expand said leading end of said outer member.

31. The system of claim 30, wherein said inner member includes an enlarged trailing end portion and an intermediate nose tapered between said enlarged trailing end portion and a portion of said inner member extending from said enlarged trailing end portion, and said outer member includes an inner surface along said passage, wherein in said second position said intermediate nose of said inner member engages said inner surface of said passage to radially expand said trailing end of said outer member.

32. The system of claim 31, wherein said inner member includes a threaded portion to threadingly engage a threaded portion of said inner surface along said passage.

33. The system of claim 31, wherein said intermediate nose and said leading end nose engage respective portions of said inner surface of said passage to expand said leading end of said outer member and said trailing end of said outer member.

34. The system of claim 27, wherein said elongated inner member includes an enlarged trailing end portion and an intermediate nose tapered between said trailing end portion and a portion of said elongated inner member extending from said enlarged trailing end portion, wherein in said second position said intermediate nose of said elongated inner member engages said elongated outer member to expand said trailing end of said elongated outer member and engage bony tissue along the pathway.

35. The system of claim 25, wherein the adjacent bony structures are first and second cervical vertebrae.

36. The system of claim 25, wherein the adjacent bony structures include a first cervical vertebra and an occiput.

37. The system of claim 25, wherein the adjacent bony structures include first and second cervical vertebrae and the occiput.

38. The system of claim 25, wherein said stabilization device includes a leading end and a trailing end, at least one of said leading end and said trailing end being expandable to engage bony tissue along the pathway.

39. The system of claim 38, wherein each of said leading end and said trailing end is expandable to engage bony tissue along the pathway.

40. The system of claim 25, wherein the pathway includes a blind end in one of the adjacent bony structures and an opening to receive a leading insertion end of the stabilization device in the other of the adjacent bony structures.

41. A method for stabilizing adjacent bony structures, comprising:  
forming an opening in a lateral mass of a cervical vertebra;



forming a curved pathway from the opening and through a facet joint formed by adjacent articular surfaces of the cervical vertebra and an adjacent bony structure; and

positioning an elongated stabilization device through the opening and along the curved pathway to link the cervical vertebra with the adjacent bony structure.

42. The method of claim 41, wherein the cervical vertebra is the C2 vertebra and the adjacent bony structure is the C1 vertebra.

43. The method of claim 42, wherein the pathway further extends through the C1 vertebra and through the joint formed between a superior articular surface of the C2 vertebra and an occiput condyle of the occiput.

44. The method of claim 43, wherein the pathway includes a blind end in the occiput condyle and the stabilization device includes a leading end positioned adjacent the blind end in the occiput condyle.

45. The method of claim 43, wherein the pathway includes a blind end in the C1 vertebra and the stabilization device includes a leading end positioned adjacent the blind end in the C1 vertebra.

46. The method of claim 41, further comprising securing the stabilization device in the pathway by expanding at least one of a leading end and a trailing end of the stabilization device into engagement with the adjacent bony tissue.

47. The method of claim 46, wherein securing the stabilization device includes expanding each of the leading end and the trailing end of the stabilization device.

48. The method of claim 41, wherein the stabilization device includes an inner member movably received in an outer member, the inner member including a first position relative to the outer member to provide the outer member with a low profile configuration for insertion along the pathway, the inner member further being movable relative to the outer member to provide the outer member with an expanded configuration to engage bony tissue along the pathway.

49. The method of claim 41, further comprising inserting a guidewire into the lateral mass and through a facet joint formed by adjacent articular surfaces of the cervical vertebra and an adjacent bony structure before forming the curved pathway.

50. The method of claim 49, wherein forming the curved pathway includes advancing a drill instrument along the guidewire.

51. The method of claim 41, further comprising:  
forming a second opening in a lateral mass of the cervical vertebra opposite the opening;  
forming a second curved pathway from the second opening and through a facet joint formed by adjacent articular surfaces of the cervical vertebra and the adjacent bony structure;  
and

positioning a second elongated stabilization device through the second opening and along the second curved pathway to link the cervical vertebra with the adjacent bony structure.

52. The method of claim 41, further comprising securing the stabilization device in the pathway by threadingly engaging at least one of a leading end and a trailing end of the stabilization device with the adjacent bony tissue.

53. The method of claim 52, wherein securing the stabilization device includes threadingly engaging each of the leading and trailing ends of the stabilization device with the adjacent bony tissue.

54. The method of claim 52, further comprising engaging an engagement member at a trailing end of the stabilization device with the bony structure about the opening and compressing the cervical vertebra and adjacent bony structure.